

R.G. HALEY SITE SEDIMENT REMEDIAL INVESTIGATION SCOPE OF WORK

PURPOSE

The purpose of this Sediment RI Scope of Work (SSOW) for the R.G. Haley Site is to implement the Agreed Order (AO) entered into by Washington State Department of Ecology (Ecology) and Douglas Management Company (Douglas), to which this SSOW is an Exhibit.

The sediment RI is intended to provide sufficient data and analysis to determine if sediments in the Site area have been impacted by activities at the R.G. Haley property, and if so, to enable the evaluation of remedial options during completion of the Site Feasibility Study (FS).

TASK 1 SEDIMENT RI PROGRESS REPORTS

Douglas shall submit progress reports regarding the sediment RI every two months unless a longer reporting period is approved by Ecology in writing. These progress reports may be combined with other progress reports required under the AO, if desired by Douglas. Progress reports shall be submitted to Ecology until Section VI of the AO is satisfied. The progress reports shall be submitted by the 10th of every second month following the effective date of the AO. If this day is a weekend or holiday, deliverables will be submitted to Ecology on the next business day. At a minimum, progress reports shall contain the following information regarding the preceding reporting period:

- A description of the actions that have been taken to comply with the AO and SSOW during the previous reporting period;
- An estimate of the percentage of sediment RI work completed to date;
- Summaries of sampling and testing reports and other data reports received by Douglas;
- Summaries of deviations from approved work plans;
- Summaries of contacts with representatives of the local community, public interest groups, press, and federal, state or tribal government;
- Summaries of the problems or anticipated problems in meeting the schedule or objectives set forth in the SSOW and sediment work plan;
- Summaries of solutions developed and implemented or planned to address any actual or anticipated problems or delays;
- Changes in key personnel; and
- A description of work planned for the next reporting period.

TASK 2 SEDIMENT RI WORK PLAN

In order to plan and manage the sediment RI, Douglas shall document project tasks and management strategies in a sediment RI work plan. This work plan shall include an overall description and schedule of all sediment RI activities. The work plan shall not be implemented until approved by Ecology.

The sediment RI work plan shall specify and describe all tasks to be accomplished to complete the sediment RI in accordance with the AO and this SSOW. The work plan shall clearly describe the overall project management strategy for implementing and reporting on sediment RI activities. The responsibility and authority of all organizations and key personnel involved in conducting the sediment RI will be outlined.

Elements of the sediment RI work plan will include, but not be limited to, the following:

- A project management strategy for achieving timely submittal of high quality deliverables;
- A draft outline of the final sediment RI report including the types of data evaluation, figures, and tables that will be included;
- A review of existing data to support the development of sediment RI tasks which may include, as available and appropriate, the following:
 - Potential sources of contamination, including current and historic activities on the offshore and upland portions of the site and in the vicinity of the site, and information on current and historical discharges
 - Sediment and water quality chemical data, including contaminant concentrations and conventional parameters, depths and location of samples, and comparison to Sediment Management Standards (SMS) and water quality criteria
 - Bathymetric data, including information on bank elevations and slopes
 - Fish and shellfish resources; recreational, commercial, and tribal fisheries
 - Benthic, epibenthic, and fish community structure
 - Toxicity testing and histopathology results
 - Bioaccumulation in tissues
 - Occurrence of endangered or threatened species and sensitive habitats (e.g. eel grass beds, spawning areas)
 - Current patterns and velocity
 - Rate of natural recovery
 - Deposition/resuspension rates
 - Current or planned land uses which may affect investigation and cleanup activities
 - Dredging records
 - Navigational depth requirements and locations
 - Structure locations (e.g. piers, docks, outfalls)
 - Recent and historical aerial photographs;
- A description of individual sediment RI subtasks;
- A proposed schedule, including a timeline for completing all sediment RI subtasks and submitting interim and final deliverables to Ecology, including but not limited to the deliverables enumerated in this SSOW;
- The proposed composition and individual qualifications of a technical team or teams of personnel and/or contractors responsible for sediment RI subtasks; consultants and laboratories used by Douglas under this AO shall have demonstrated experience with sediment sampling and analysis in accordance with the SMS.

TASK 3 OTHER SEDIMENT RI PROJECT PLANS

Douglas will prepare, for Ecology review, and approval a Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP). A Health and Safety Plan (HASP) shall also be submitted but is not subject to Ecology approval. Details of these plans are provided below.

SAMPLING AND ANALYSIS PLAN

Douglas shall prepare a SAP for sediment sampling and analysis activities in accordance with WAC 173-340-820, WAC 173-204-600, and the Sediment Cleanup Standard User's Manual, as updated. The purpose of the SAP is to provide an overview of the sediment sampling program that will satisfy the data needs described in Task 4 of the SSOW.

The SAP shall describe the sampling objectives and the rationale for the sampling approach. A detailed description of sampling tasks will be provided, including specifications for sample identifiers; vessel positioning; the type, number and location of samples to be collected; the analyses to be performed; descriptions of sampling equipment and collection methods to be used; description of sample documentation; sample containers, collection, preservation and handling.

QUALITY ASSURANCE PROJECT PLAN

Douglas shall prepare a Quality Assurance Project Plan (QAPP) for sediment sampling and analysis activities. The QAPP shall identify and describe measures that will be taken during the performance of all sampling and analysis tasks to ensure that data quality objectives are fulfilled. Data quality objectives will reflect the criteria or threshold values used for remedial decisions. The QAPP shall be developed in accordance with Ecology guidance and the requirements of the Ecology Laboratory Accreditation Program and the Puget Sound Estuary Program (PSEP) and contain the following elements:

- A brief project description, referencing the attached work plan and SAP for details;
- Project personnel and quality assurance (QA) responsibilities;
- QA objectives;
- Field QA measures, including sample acceptability criteria, field QA samples, and calibration of field instruments, referencing the SAP for a discussion of decontamination procedures and sample custody and handling;
- QA for chemical analyses, including:
 - Calibration procedures, references, and frequency of calibration
 - Analytical methods
 - A table of laboratory QA samples for each analytical method, including blanks, duplicates/triplicates, MS/MSDs, SRMs, surrogate spikes, etc.
 - Data management, validation, and reporting
 - Assessment of data precision, accuracy, and completeness
 - Corrective actions
 - QA reports;
- QA for biological testing, including:
 - Biological testing procedures, including detailed method descriptions
 - Laboratory QA including use of positive controls, negative controls, reference sediments, measurement of water quality parameters, and any other QA procedures described for individual biological tests in the 1995 PSEP protocols for bioassays and/or modifications required by Ecology
 - Bioassay performance standards and corrective measures

- Statistical methods used to test for statistical significance and to compare site data to reference data (if performed by the laboratory, otherwise include in work plan or SAP)
- Reporting of bioassays data
- QA reports;
- QA for physical measurements (e.g. bathymetry, and currents) shall be consistent with PSEP protocols and current national guidance (e.g. Corps of Engineers manuals).

When possible, Douglas shall use a laboratory accredited by Ecology for the specific analyses to be performed under the AO. If an unaccredited lab is proposed to be used, the results of recent performance audits and systems audits will be provided to Ecology prior to use of the lab.

HEALTH AND SAFETY PLAN

Douglas shall prepare a Health and Safety Plan (HASP) for sediment activities in accordance with WAC 173-340-810. The HASP will be consistent with the requirements of the Washington Industrial Safety and Health Act of 1973, Chapter 49.17 RCW, including any updates or amendments. The HASP will identify specific monitoring and management responsibilities and activities to ensure the protection of human health during implementation of sediment RI.

TASK 4 SEDIMENT REMEDIAL INVESTIGATION

Sediment RI sampling activities will enable Douglas to develop a proposed and, after public comment, final cleanup action plan for the Haley site. The key components of this task are as follows:

- Identify nature and extent of contaminants exceeding sediment quality standards (SQS) and minimum cleanup levels (MCUL);
- Assessment of potential human health concerns;
- Natural resources characterization;
- Physical characterization;
- Natural recovery evaluation (if proposed by Douglas);
- Source control and recontamination evaluation.

Details of these elements are provided below.

1. Identify nature and extent of contaminants exceeding SQS and MCUL - Surface sediment samples shall be collected from the biologically active zone as defined for Bellingham Bay (upper 12 centimeters). Subsurface sediment sampling may be restricted to those areas where dredging is likely to be a remedial action and/or to locations where current or future activities may expose deeper contaminated sediments with special consideration for State Managed Aquatic Lands. The horizontal and vertical extent of sediments requiring remediation will be determined through one or more of the approaches listed below. Different approaches or a combination of these approaches may be proposed for the site, depending on site characteristics identified in the sediment RI work plan.
 - a. Biological testing with optional chemistry - Biological testing, if conducted, will use the methods outlined in WAC 173-204-315, or other equivalent acute and chronic bioassays approved by Ecology. Additional sediment will be collected and archived, to be analyzed

following receipt of biological testing results at Douglas' option. Grain size and TOC will be analyzed along with bioassays to assist in interpreting results.

- b. Chemical analysis with confirmatory biological testing - Samples shall be analyzed for relevant analytes listed in Table III of the Sediment Management Standards and for other deleterious substances that have been detected at the site or would reasonably be expected to be present. Analytical techniques will be sufficiently sensitive to detect chemicals at concentrations equal to, or below, SQS and Dredge Material Management Program (DMMP) screening levels (SLs).

Confirmatory biological testing may be conducted by Douglas to confirm exceedance of SQS or MCUL criteria, and may also be required by Ecology to evaluate the potential for adverse effects associated with any detected chemicals lacking chemical criteria.

- c. Concurrent chemical analysis and biological testing - Chemical analysis and biological testing will be conducted at each station. Biological tests will be conducted as described above. Chemical analyses may be limited to indicator chemicals useful in distinguishing sources or to the primary contaminants of concern.

2. Assessment of potential human health concerns - WAC 173-204-570 (5) requires that cleanup standards be protective of human health. If existing information is inadequate, Douglas may be required to perform additional bioaccumulation studies to determine the human health implications of ingesting marine organisms affected by site sediment contamination. Department of Health and Ecology Tier I guidance on human health standards for sediments will be used to calculate allowable tissue concentrations. Actual tissue concentrations will be compared to calculated allowable concentrations to evaluate potential human health concerns. Tier II guidance will be used to evaluate human health risk assessment for chemicals without criteria values.
3. Natural resources characterization - Based upon existing natural resource information, Douglas may be required to collect additional general information on natural resources at or near the site that could be potentially exposed to contaminants, including but not limited to, habitat types, sensitive ecosystems, and plant and animal species. More detailed studies may need to be conducted through a sediment RI work plan addendum if required to evaluate remedial alternatives.
4. Physical characterization - Characterization of the physical nature of the site shall provide information necessary for preliminary evaluation of the remedial options. The physical characterization shall include substrate type (i.e., grain size) and distribution, total organic carbon, interstitial salinity (if bioassays are to be performed in areas influenced by freshwater), outfall locations, bathymetry, and the relationship between bathymetry and engineered waterfront structures (e.g., piers, wharves, buildings, dolphins, beams, embankments, bulkheads, etc.). The purpose of the analysis will be to assess the effects of the engineered structures and other physical features on the effectiveness, implementability, and costs of remedial options.
5. Natural recovery evaluation - If Douglas proposes natural recovery for some areas of the site, additional analyses may be required by Ecology to determine if natural recovery is a feasible component of the selected remedial option. Sediment stratigraphy may be used to assess

sediment accumulation and mixing. Modeling may be used to assess the potential for sediment natural recovery. However, modeling will be used only in conjunction with site specific data on key input parameters such as sediment accumulation rates. The development of natural recovery arguments shall be fully documented with actual field data or technical references.

6. Source control and recontamination evaluation - Douglas will assess the potential for recontamination of site sediments from existing sources within or immediately adjacent to the site. This will be accomplished by compiling existing data, sampling surface sediment as described in this SSOW, and sampling soil and groundwater in the upland portion of the site in accordance with the upland RI work plan, which is an attachment to the AO. Douglas shall make recommendations to Ecology if further investigation or control of sources is needed.

DELIVERABLES

All plans, reports and studies listed below shall be prepared as follows: A draft shall be submitted to Ecology and DNR for review and comment in accordance with Section V of the AO; Ecology and DNR comments shall be addressed and a draft final submitted to Ecology for public review; Ecology, with assistance from Douglas, will prepare a Responsiveness Summary which will be included as an appendix to the final document; Douglas will prepare a final document addressing public comments for Ecology approval. Revisions to final plans shall be in accordance with Section VI of the AO. Modifications to final plans that Ecology determines are not significant will not be subject to public review. The deliverables will consist of the following:

SEDIMENT RI WORK PLAN, SAP, QAPP AND HASP

Douglas shall submit for Ecology review and approval a sediment RI work plan, SAP and QAPP in accordance with the schedule below. The HASP shall also be submitted but not reviewed by Ecology.

SEDIMENT RI REPORT

Douglas shall summarize and compile the results of Task 4 in the sediment RI report. The sediment RI report will also summarize the results of exploration activities in the upland portion of the site. The sediment RI report shall follow the draft outline contained in the sediment RI work plan in addition to any revisions made during the course of work. Revision of the outline shall require approval of Ecology.

ADDITIONAL STUDIES

Douglas shall submit draft addenda to the sediment RI work plan, SAP and QAPP, as well as any other planning documents, reports, and other deliverables associated with any additional aquatic studies necessary as identified by Ecology or Douglas in accordance with Section V of this Agreed Order within thirty (30) days of receipt of a written request by Ecology to prepare such documents, unless otherwise specified by Ecology.

SCHEDULE

The schedule for all tasks described in this SSOW and other elements of the RI/FS is presented in Exhibit 5 of the AO. If, at any time during the RI/FS process, unanticipated conditions or changed circumstances are discovered which may result in a schedule delay, Douglas shall bring such information to the attention of Ecology. Pursuant to Section VI (13) of the AO, Ecology will determine whether a schedule extension is warranted. For every deliverable, report, memorandum, plan, or other item required under this SSOW, if Ecology disapproves or requires modification or revision of any deliverable, report,

memorandum, plan or other item, in whole or in part, Douglas shall submit a modified or revised version thereof to Ecology in accordance with Section V of the AO. Such modifications or revisions may qualify for schedule extensions.

Any deadline that falls on a holiday or weekend will be extended to the next business day.